STATE OF MAINE
2007 GRADE SPAN EXPECTATIONS FOR MEA at GRADES 4 and 8
from Maine's *Learning Results*

Science and Technology - Grade Span 3 - 4

Cluster 1 – Life Science	Cluster 2 – Physical Science	Cluster 3 – Earth and Space Science	Cluster 4 – Nature and Implications of Science
A. Classifying Life Forms A.1. Group the same organisms in different ways using different characteristics. A.4. Compare and contrast the life cycles, behavior, and structure of different organisms. **B. Ecology** B.1. Describe a food web and the relationships within a given ecosystem. B.2. Explain the difference between producers (e.g., green plants), consumers (e.g., those that eat green plants), and decomposers (e.g., bacteria that break down the "consumers" when they die), and identify examples of each. B.3. Compare and contrast physical and living components of different biomes - i.e., regions characterized by their climate and plant life - (e.g., tundra, rain forest, ocean, desert). **C. Cells** C.1. Demonstrate an understanding that a cell is the basic unit of living organisms. C.4. Describe the functions of the major human organ systems.	**E. Structure of Matter** E.2. Explain how matter changes in both chemical and physical ways. **H. Energy** H.1. Identify different forms of energy (e.g., light, sound, heat). **I. Motion** I.1. Describe the effects of different types of forces (e.g., mechanical, electrical, magnetic) on motion. I.2. Draw conclusions about how the amount of force affects the motion of more massive and less massive objects.	**D. Continuity and Change** D.1. Identify present day organisms that have not always existed, and past life forms that have become extinct. D.3. Explain how adaptations, in response to change over time, may increase a species' chances of survival. D.4. Describe ways in which organisms may be similar to and different from their parents and explore the possible reasons for this. **F. The Earth** F.3. Describe differences among minerals, rocks, and soils. F.4. Illustrate how water and other substances go through a cyclic process of change in the environment. **G. The Universe** G.1. Illustrate the relative positions of the sun, moon, and planets. G.2. Trace the sources of earth's heat and light energy to the sun. G.3. Describe earth's rotation on its axis and its revolution around the sun. G.4. Explore the relationship between the earth and its moon.	**J. Inquiry and Problem Solving** J.1. Make accurate observations using appropriate tools and units of measure. J.2. Conduct scientific investigations: make observations, collect and analyze data, and do experiments. J.3. Use results in a purposeful way: design fair tests, make predictions based on observed patterns, and interpret data to make further predictions. **K. Scientific Reasoning** K.3. Draw conclusions about observations. K.4. Use various types of evidence (e.g., logical, quantitative) to support a claim. K.5. Demonstrate an understanding that ideas are more believable when supported by good reasons. **L. Communication** L.4. Make and/or use sketches, tables, graphs, physical representations, and manipulatives to explain procedures and ideas. L.6. Cite examples of bias in information sources and question the validity of information from varied sources. **M. Implications of Science and Technology** M.3. Explore how technology (e.g., transportation, irrigation) has altered human settlement. M.4. Explain practices for conservation in daily life, based on a recognition that renewable and non-renewable resources have limits.

STATE OF MAINE
2007 GRADE SPAN EXPECTATIONS FOR MEA at GRADES 4 and 8
from Maine's *Learning Results*

Science and Technology - Grade Span 5- 8

Cluster 1 – Life Science	Cluster 2 – Physical Science	Cluster 3 – Earth and Space Science	Cluster 4 – Nature and Implications of Science
A. Classifying Life Forms A.3. Describe some structural and behavioral adaptations that allow organisms to survive in a changing environment. **B. Ecology** B.1. Describe in general terms the chemical processes of photosynthesis and respiration. B.2. Analyze how the finite resources in an ecosystem limit the types and populations of organisms within it. B.4. Generate examples of the variety of ways that organisms interact (e.g., competition, predator/prey, parasitism/mutualism). **C. Cells** C.4. Identify the causes and effects of diseases, explain their transmission, and identify prevention strategies. C.5. Describe how body systems work together.	**E. Structure of Matter** E.1. Predict and test whether objects will float or sink based on a qualitative and quantitative understanding of the concepts of density and buoyancy. E.4. Describe how a substance can combine with different substances in different ways, depending on the conditions and the properties of each substance. E.5. Describe how the motion of the particles of matter determines the state of that matter (e.g., solid, liquid, gas, plasma) and vice versa. E.7. Investigate the similarities and differences between elements, compounds, and mixtures. **H. Energy** H.2. Demonstrate that energy cannot be created or destroyed but only changed from one form to another. H.3. Compare and contrast the ways energy travels (e.g., waves, conduction, convection, radiation). H.5. Categorize energy sources as renewable or non-renewable and compare how these sources are used by humans. **I. Motion** I.1. Describe the motion of objects using knowledge of Newton's Laws. I.2. Use mathematics to describe the motion of objects (e.g., speed, distance, time, acceleration).	**D. Continuity and Change** D.2. Explain how scientists use fossils to prove that life forms, climate, environment, and geologic features in a certain location are not the same now as they were in the past. D.4. Compare how sexually and asexually reproducing species transfer genetic information to offspring. **F. The Earth** F.1. Demonstrate how the earth's tilt on its axis results in the seasons. F.2. Describe how soils are formed and why soils differ from one place to another. F.4. Describe factors that can cause short-term and long-term changes to the earth. **G. The Universe** G.1. Compare past and present knowledge about characteristics of stars (e.g., composition, location, lifecycles) and explain how people have learned about them. G.5. Describe the motions of moons, planets, stars, solar systems, and galaxies.	**J. Inquiry and Problem Solving** J.1. Make accurate observations using appropriate tools and units of measure. J.2. Design and conduct scientific investigations which include controlled experiments and systematic observations. Collect and analyze data, and draw conclusions fairly. J.3. Verify and evaluate scientific investigations and use the results in a purposeful way. **K. Scientific Reasoning** K.6. Support reasoning by using a variety of evidence. K.8. Construct logical arguments. K.9. Apply analogous reasoning. **L. Communication** L.4. Make and use scale drawings, maps, and three-dimensional models to represent real objects, find locations, and describe relationships. **M. Implications of Science and Technology** M.4. Describe an individual's biological and other impacts on an environmental system. M.6. Give examples of actions which may have expected or unexpected consequences that may be positive, negative, or both.